



The Commonwealth of Massachusetts Massachusetts Water Resources Commission

Public Comment Draft
**POLICY ON LAWN AND LANDSCAPE
WATER CONSERVATION
NOVEMBER 2001**

In order to maintain, improve, and protect the natural flows and quality of surface and ground water resources, ensure the reliability of public water supplies in the Commonwealth, and provide a comprehensive statewide approach for reducing landscape water use, the Water Resources Commission adopts the following policy as an addendum to the Massachusetts State Water Conservation Policy:

Water used for maintaining landscapes and lawns should not be used at the expense of public health and safety or the environment. Water that is used for maintaining landscapes and lawns should be used in a manner that minimizes such use through the implementation of sound water conservation and water efficiency practices.

The purpose of this policy is to address the impacts of landscape water use on municipal and community water supply systems and on the environment. Water demands generally peak during summer months when water supplies are lowest. In some communities, water use doubles or triples as water demand for landscape purposes increases. Water used for lawn and landscape watering purposes is a consumptive use of water as the water is lost to evaporation and to uptake by plants with root systems within the top few inches of soil. The water is not available to replenish groundwater aquifers or surface waters.

This policy also addresses the use of private wells for landscape and lawn watering purposes. Private wells can also have environmental impacts, and to the extent that private wells draw from the same aquifer that is used by the public supplier they may contribute to the reduction of groundwater levels. Finally, the use of private wells for maintaining lawns or landscapes during periods when outdoor water use bans are in effect make it difficult for suppliers to implement and enforce these restrictions. Therefore, minimizing the amount of water used for lawn irrigation and lawn watering and using water efficiently is important when using private wells for lawn irrigation and lawn watering purposes.

Lawns are generally the most water intensive elements of the landscape and lawn watering contributes substantially to peak water consumption in summer months. Greatly increased water withdrawals associated with meeting the peak demands caused by lawn and landscape watering needs can lead to water quality, environmental, and potential public health and safety problems.

Large peak demands that exceed the intended capacity of the water supply system can impair water quality. As more water is pumped from water sources, pollution existing in outlying areas can be drawn into drinking water supplies. This can include inducing surface and other waters that may contain higher levels of pathogens and/or drawing in toxic plumes that may exist in nearby groundwater. Higher pumping rates also have the potential to increase levels of iron and manganese and, in coastal communities, sodium in water supplies. These naturally occurring elements may affect the aesthetic quality of drinking water, and may require treatment to remove.

Greatly increased water withdrawals to meet summertime peak demands may place the water system under stress, leading to service problems and potential public safety concerns. For example, municipal and community water systems facing large demands may experience low pressure leading to low levels of service for customers and in severe cases, diminished fire-fighting capabilities. Large peak demands also exacerbate the need to develop new sources with additional environmental impacts and expense to water supply customers.

The ecological impacts of large water withdrawals occur where drinking water supplies are closely linked to surface water bodies and wetlands. The draw down or dewatering of these surface water bodies may have harmful effects on the natural resources, including the natural biodiversity and habitat they support. Moreover, the effects of pollutants on water bodies and the biodiversity and habitat they support may be magnified when water volumes are decreased.

The objectives of this policy are:

- ?? To protect the Commonwealth's water resources so that they may continue to benefit the citizens of the Commonwealth in a manner compatible with protecting our natural resources.
- ?? To promote public awareness of the impacts of excessive water use and of appropriate landscaping and lawn water conservation practices and to provide guidelines to minimize the amount of water used for lawn and landscape watering and irrigation purposes.
- ?? To encourage water suppliers and municipalities to develop drought and water shortage plans and related enforceable water use restrictions to provide for the effective management of public water supplies to meet current and future needs while protecting environmental resources.
- ?? To encourage all citizens to minimize water use related to landscape needs and to ensure that communities abide by water restrictions imposed by water suppliers and communities.

Meeting these objectives requires recommendations for a range of groups, including:

- ?? Property owners and managers;
- ?? Property owners and managers responsible for recreational fields;
- ?? Property owners and managers using private wells;

- ?? Communities and public water suppliers; and
- ?? State agencies

Recommendations for Property Owners and Managers

Landscape management is the responsibility of each individual property owner and property manager. How property owners and managers design, construct, and maintain their landscapes can have a significant impact on the water demands of a water supplier. These recommendations are meant to help property owners and property managers undertake their responsibilities so as to minimize water use. The recommendations are applicable to all property owners and managers, whether they use water from public water supply systems or private wells.

Minimize Lawn Size

By reducing lawn size in landscape design, property owners will reduce the amount of water necessary for landscape maintenance. Because lawns are typically the most water demanding elements of the landscape, reducing lawn size will not only reduce the stress on water supplies during high demand periods, but will also reduce the individual customer's water bill. Replacing lawn area with trees and shrubs can benefit property owners by creating privacy and shading lawn areas thereby reducing landscape water needs. An added benefit is that these elements can also provide shade around homes, offering potential savings on indoor cooling costs.

Choose Drought Tolerant Native Plant Species

Choosing drought tolerant native species for landscaping will both reduce water needs and create wildlife habitat. These species can reduce the need for supplemental landscaping inputs such as water and landscaping chemicals because these species have adapted to the environmental conditions of New England. Generally, an insect resistant mixture of grasses that includes a high percentage of fine fescues will ensure a drought tolerant lawn.

Water Only When Necessary

Over-watering causes turf problems by encouraging fungal growth and disease as well as the development of shallow, compacted root systems that are vulnerable to drought and foot traffic. Turf water needs vary according to many factors including: amount of solar radiation, temperature, humidity, grass species and rate of growth, rooting depth, and soil texture. In order to determine when to water, one should observe both soil and turf conditions.

Abide by Water Restrictions and Other Conservation Measures Implemented by Your Community

Communities and water supply managers need the cooperation of their users in order to manage the water supply system in a manner that is protective of public health, safety, and the environment. Abiding by water restrictions and other measures is critical to ensuring the viability of the system for all users and for ensuring the protection of the environment.

Do Not Water Lawns and Do Not Install Automatic Lawn Irrigation Systems in Water Short Communities

Some communities face chronic water shortage problems. In these communities, property owners and managers should minimize outdoor water use and refrain from lawn watering.

Additionally, automatic lawn irrigation systems should not be installed in water short communities.

Install Rain Shutoff Devices on Automatic Irrigation Systems

In communities that allow the installation of automatic irrigation systems, a rain shutoff device should be used. This device automatically shuts-off the automatic irrigation system when it rains, protecting the landscape from over-watering and saving property owners and managers money by guaranteeing that water is not wasted. Rain shutoff devices are inexpensive, easy to install, and can be installed on any automatic irrigation system.

Collect and Reuse Water for Landscaping Needs

Use cisterns or rain barrels to capture rainwater from downspouts to use for flowerbeds, shrubs, and newly planted trees. Proper use of these systems can greatly reduce water use from the municipal system.

Mow Lawns at the Highest Recommended Height

Many turf grass species are healthiest when kept between 2 ½ and 3 inches. Longer grass has more leaf surface to take in sunlight, allowing it to grow thicker and develop a deeper root system, which in turn helps grass survive drought, tolerate insect damage, and fend off disease. Longer grass also shades the soil improving moisture retention.

Recommendations for Property Owners and Managers Responsible for Recreational Fields

Property owners and managers responsible for recreational fields, such as playing fields and golf courses, should also work to minimize water use as they maintain their facilities. For playing fields, reducing the turf area is generally not an option. For other facilities, such as golf courses, design considerations can greatly reduce the water needs. In addition to the general recommendations for property owners above, specific recommendations for these facilities are:

Design Facilities to Minimize Water Use

Facilities should be designed to minimize water use needs. This includes choosing types of grass and plant species that require less water. It also may mean minimizing high water use areas. For playing fields this may mean limiting irrigation to the playing areas themselves and not irrigating surrounding areas. For golf courses¹ minimizing irrigation needs should be considered in the design of fairways. Finally, ensuring that sufficient loam is used under the irrigated areas will: promote a healthy grass field; improve the turf's moisture retention capacity; and reduce watering needs.

Maintain Facilities to Minimize Water Use

Maintenance activities, particularly the frequency and height of lawn mowing, can greatly affect water needs. Longer grass blades support deeper root systems and enhance drought resilience. Therefore, minimizing mowing during extremely hot periods can help reduce water needs.

¹ The Massachusetts Department of Environmental Protection recently revised the Golf Course Water Use Policy, Effective Date: June 8, 2000, Policy #: BRP/BWM/PeP-P00-5.

Use Automatic Irrigation Systems to Reduce Water Use

Recreational facilities are generally able to install more sophisticated irrigation system controls to ensure irrigation is undertaken in the most efficient manner for the property. The controllers and components of these systems should enable site specific irrigation according to the particular plant and soil conditions of the landscape elements. Irrigation should also be scheduled to occur during the cooler parts of the day to minimize evaporation of water.

Use Reused² Water Where Possible

Treated wastewater can be used for irrigation for facilities like golf courses where contact with the irrigated areas is less direct than other playing fields. Property managers should consult with the Department of Environmental Protection to design a water reuse system for their property.

Raise Public Awareness

Facilities that use water efficient techniques and other innovative approaches should develop outreach materials such as signs, brochures, and other materials to educate the public on how to effectively manage property while minimizing or eliminating water use.

Recommendations for Property Owners and Managers Using Private Wells or Water Sources

Property owners and managers who use water from private wells or other private sources should follow the same practices as those on public systems in order to minimize water use for lawn and landscape watering purposes. In addition, property owners and managers should closely monitor whether their water withdrawals are having negative environmental impacts and reduce use accordingly. In particular, users of private water sources should:

- ?? Abide by water restrictions and other conservation measures put into affect by the community. This is particularly true if the restrictions are caused by dry conditions rather than a water shortage caused by a system problem.
- ?? Users of private waters sources should not hook up pumps to withdraw water directly from any small ponds/lakes, streams, or rivers. These withdrawals can have negative environmental impacts, including impacts to fisheries and wildlife resources, particularly if multiple properties are drawing water from these surface water bodies.

Recommendations for Municipalities and other Public Water Suppliers

Raise Public Awareness

Outdoor water used for lawn irrigation is the largest non-essential water use and is one that involves both residential and commercial water users. Therefore, building public awareness of the limitations of local water supplies and the consequences of overuse through public outreach is a key component of developing and implementing a drought or water shortage plan. A well-

² The Department of Environmental Protection has developed *Interim Guidelines on Reclaimed Water*(Revised), Effective Date: January 2000, Policy #: BRP/DWM/PeP-P00-3.

informed community will understand the vulnerability of local water supplies to overuse and will respond when asked to minimize unnecessary water use.

Develop Drought Management Plans

Contingency plans for drought and other water shortage circumstances are a critical component of any water supply management program. These plans establish what levels of dry or drought conditions are likely to lead to a water supply shortage or emergency and establish the actions to be taken to prevent the emergency and to respond should one occur (recognizing that not all water shortage circumstances are the result of drought, the term drought is used throughout this section to reflect situations where the water shortage is the result of naturally stressed water supplies and water supplies that are drought stressed). Communities that have limited water supplies may implement parts of their plan during non-drought years to help reduce peak demands that threaten the water supply system or the environment.

There are three key elements of drought planning that water suppliers and local governments should have in place to manage water supplies relative to water use for irrigation and for drought conditions. These elements should be integrated with the water suppliers more comprehensive emergency response planning efforts.

The three elements specific to drought situations are:

1. Drought indicators and drought stage triggers;

The proper drought indicators for each particular water supply system will depend on the specific circumstances of the system. Some examples of drought indicators include: reservoir elevation, storage tank elevation, elevation of nearby surface water bodies, system pressure, streamflow levels, groundwater levels, regulatory limits, and precipitation conditions. By assessing these indicators, water suppliers can develop drought stage triggers that act as benchmarks to provide warning signals of impending water shortages.

2. Drought restriction measures;

Water use restrictions that correspond with each particular drought stage should be developed to ensure a sufficient and predictable response to excessive seasonal water use and drought conditions. The restrictions should be comprised of a graduated series of increasingly stringent restrictions, culminating in a ban on outdoor water use, so that a water supplier can implement an appropriate response based on the severity of dry conditions or the water supply problem.

3. Water use restriction bylaws or regulations;

All communities responsible for operating public water supply systems should have a water restriction by-law in place. Such a by-law gives the appropriate person or board the power to declare water restrictions as necessary. These powers are important to allow a community to have a predictable plan in place to reduce water use as drought conditions develop. Water districts or boards should adopt similar restrictions through adoption of rules or regulations.

An effective water use restriction by-law allows water suppliers to limit consumption in an increasingly restrictive manner that corresponds with the specific drought stages for that community's water supply. The specific restrictions should also be based on triggers that have been established in the water supplier's drought management plan. The plan should identify both water system and environmental triggers that correspond with the implementation of the specific restrictions included in the by-law.

Additional recommendations are included below.

Develop A By-law Requiring The Use of Rain Shutoff Devices For Automatic Irrigation Systems or Banning Automatic Irrigation Systems

While automatic irrigation systems can provide an efficient means of landscape irrigation, they can also increase the overall demand on a municipal water supply system by providing the ability to automatically use water to irrigate lawns. Therefore, communities with severe water shortages or capacity limitations should consider, in addition to adopting tough water use restrictions, banning or enacting a moratorium on the installation of automatic irrigation systems until the system can be improved to meet the increased demand. Other communities should consider adopting procedures to ensure that automatic irrigation systems are installed and used so as to maximize the efficiency of water use.

In order to be efficient, in-ground systems must be installed correctly and programmed to deliver the appropriate volume of water at the appropriate rate. In addition to proper installation and programming, the use of a rain shut off device can eliminate wasted water by ensuring the irrigation system shuts off when it rains. Rain shutoff devices are inexpensive, easy to install, and can be installed on any automatic irrigation system. A by-law requiring the installation of rain shutoff devices on automatic irrigation systems that are connected to the municipal water supply is strongly recommended.

Develop a By-law Minimizing High Water Use Landscape Areas

By minimizing the loss of natural vegetation and establishing smaller lawns as a standard for new development, municipalities can reduce outdoor water used for lawn watering. In addition, minimizing soil disturbance by maintaining natural vegetation will enhance groundwater recharge, reduce sediment and stormwater run-off and subsequent siltation of nearby streams, lakes and ponds, and maintain habitat for native wildlife.

There are two different mechanisms that can be used to minimize clearing activities. Regulations can be adopted into the zoning by-law, requiring a special permit for clearing of sites that exceed a certain size. As an alternative, a town may adopt Site Plan Review standards that apply to all projects requiring Site Plan approval.

Implement Conservation Rate Structures

Encourage the implementation of increasing block structures to deter inefficient outdoor water use. Consider using seasonal rates, excessive use, drought rates, and second meter rates that encourage outdoor water conservation. Communities should avoid providing cheaper water rates for outdoor use and avoid the use of second meters that are tied to discount rates for outdoor water use. Second meters are sometimes used in communities that provide both water and sewer

service. In these communities sewer use is based on water use. However, the practice of using second meters to discount outdoor water encourages, rather than discourages outdoor water use and should not be allowed. If second meters do exist, the water rates charged for outdoor use should be significantly higher than normal water use to discourage wasteful consumption.

Further information on conservation rates can be found in the American Water Works Associations' Manual of Water Supply Practices: Water Rates Structures and Pricing (AWWA M34).

Leak Detection and Repair

An ongoing leak detection and repair program can assure the public that ongoing demand management by the water supplier is taking place. Moreover, detecting and fixing leaks can provide one of the largest returns on investment, especially in older systems, and can be a key ingredient in public education programs, using crews in the street as a point of attention by media.

Recommendations for State Agencies

State Properties

State properties should be managed according to the recommendations section of this policy for property owners and managers. State agencies should use their property to demonstrate the ability to develop and manage low-water use landscapes. Appropriate public education and outreach should publicize these efforts.

State Regulatory Agencies

The Department of Environmental Protection is responsible for issuing permits under the Water Management Act for new and expanded sources. The DEP should continue to condition the permits of sources to ensure that peak demands do not cause significant environmental impacts. The DEP should also work to assist water suppliers in developing appropriate drought management and water shortage management plans and should have local authority to implement water restrictions as appropriate.

State Procurement Activities

State agencies responsible for the renovation and maintenance of state facilities and state agencies that procure services for lawn and landscape maintenance, should ensure that the appropriate lawn and landscape design, maintenance and construction guidelines for minimizing outdoor water use are included in the procurement bid documents and in the bid evaluation criteria used for state procurements. The guidelines should also be used by individual agencies to select vendors and contractors that agree to abide by these guidelines.